9 μm cutoff 256x256 Quantum Well Infrared Photodetector (QWIP) Focal Plane Army Camera

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ABSTRACT

Long wavelength infrared (LWIR) detectors, 8 μm to 12 μm, are of a great interest for variety of space-borne applications. These space applications have placed stringent requirements on the performance of the infrared detectors and arrays including high defectivity, low dark current, uniformity, radiation hardness and lower power dissipation. I will discuss the development and progress of $Al_xGa_{1-x}As/GaAs$ LWIR quantum well infrared photodetectors (QWIPs) to meet those stringent requirements and the demonstration of a 9 μm cutoff 128x128 QWIP focal plane array camera. The noise equivalent temperature difference of the focal plane array is 25 mK at 300 K background, and operating temperature is 70 K. The research described in this paper was performed by the Center for Space Microelectronics Technology, Jet Propulsion Laboratory, California institute of Technology, and was jointly sponsored by the Ballistic Missile Defense Organization/innovative Science and Technology Office, and the National Aeronautics and Space Administration, Office of Space Access and Technology.

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